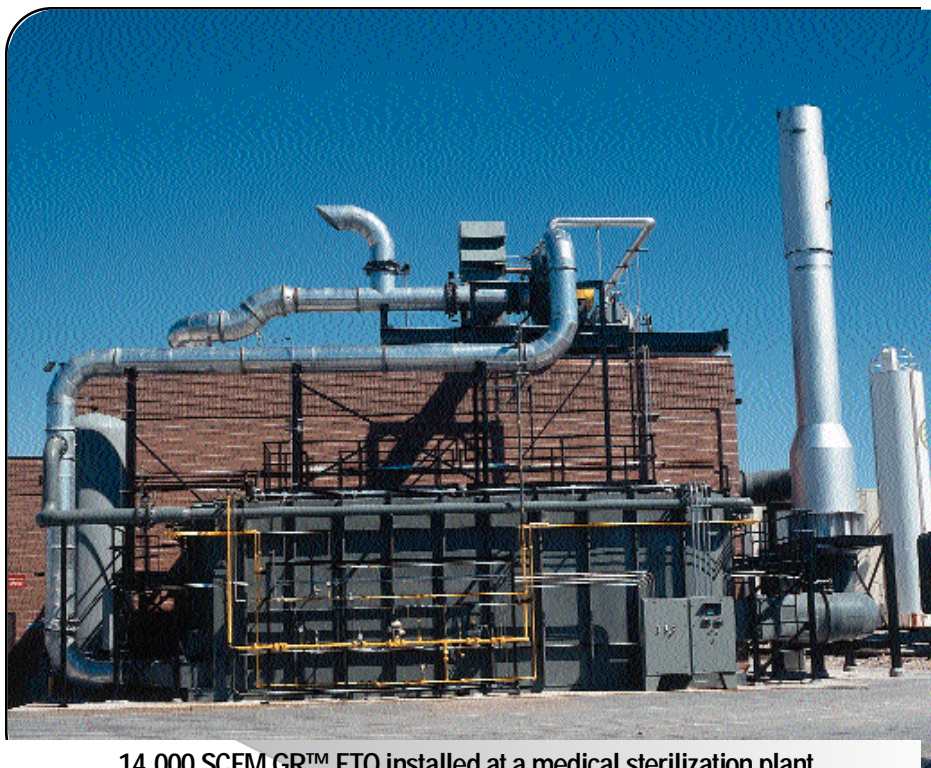


GR™ *Gas Recuperative Flameless Thermal Oxidizer*

The THERMATRIX® Gas Recuperative Flameless Thermal Oxidizer (GR FTO) system utilizes a proven, proprietary technology for the destruction of VOCs and is equipped with an internal heat recuperative process for fume streams containing a low energy content. This patented technology achieves high DREs on a wide selection of fume streams including chlorinated, fluorinated, sulfonated and batch streams and can be combined with optional equipment for heat recovery. The THERMATRIX® GR™ oxidizer is ideal for dilute fume streams and, because it operates well below the LEL, well suited for difficult-to-handle Group B compounds.



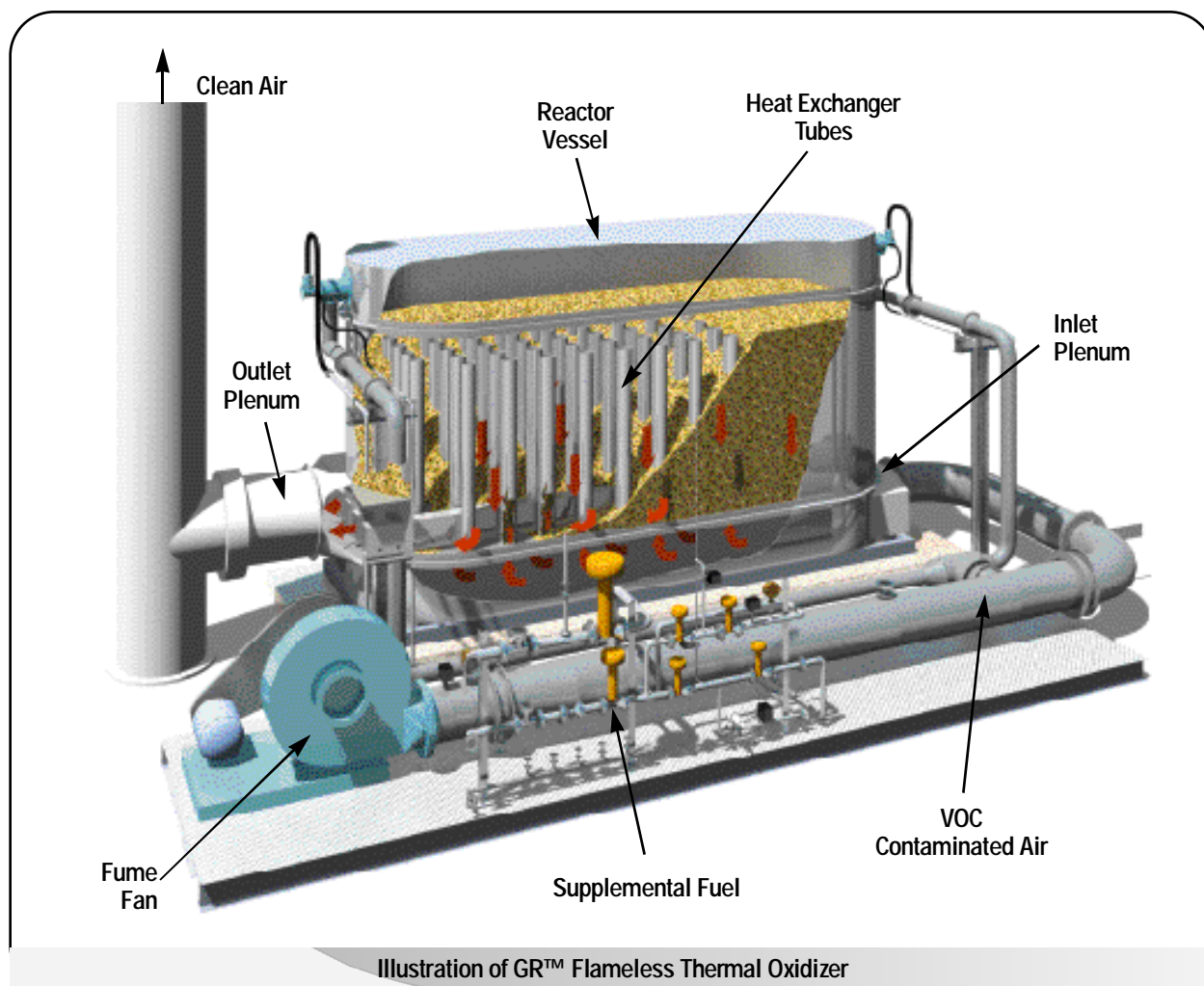
14,000 SCFM GR™ FTO installed at a medical sterilization plant.

The GR™ vessel is available in two designs, an oval shaped system and a spherical design depending on the size of the unit specified. The insulated reactor bed is filled with noncatalytic, porous inert ceramic media. Embedded in the ceramic media are internal heat exchange tubes that reduce fuel consumption by utilizing the hot exhaust gas to preheat the incoming fume. With a heat recovery efficiency of 65 to 70 percent the reactor is self-sustaining when the energy content of the fume stream is between 10 and 12 BTU/ft³.

At start-up, a preheat burner is used to elevate the temperature of the inert ceramic media to oxidation temperature. During operation the chemical energy in the fume is supplemented as needed with the injection of fuel gas directly into the fume line. The stationary reaction zone at the tube outlet eliminates bypassing, so oxidation is extremely efficient and complete.

The GR™ oxidizer is well-suited to process streams with variable flows and concentrations and is suitable for halogenated and sulfonated streams. Due to its excellent premixing, and uniform temperature profile, the FTO system achieves very high destruction efficiency while generating extremely low concentrations of NO_x and CO.

GR™ Gas Recuperative Flameless Thermal Oxidizer



Call us today to learn more about the GR™ system and let Thermatrix take you to the next level... beyond compliance. Visit us online at www.thermatrix.com.

101 Metro Dr., Suite 248
San Jose, CA 95110
(408) 453-0490 TEL
(408) 453-0492 FAX

308 N. Peters Rd., Suite 100
Knoxville, TN 37922
(423) 539-9603 TEL
(423) 539-9643 FAX

13 Waterside Park
Hessle, Hull, HU 13 OEG, England
(0) 1482 642 999 TEL
(0) 1482 644 050 FAX



GR™ Gas Recuperative Flameless Thermal Oxidizer

<i>Features</i>	<i>Benefits</i>
Guaranteed up to 99.99% DRE, <2ppmv thermal NOx	Easily permitted, creates potential for emission credits
Designed for recouping heat internally	Applied to less concentrated organic fume streams
Operates in flameless mode, below the LEL for most gases	Can be installed near the emission source
No moving parts, no hot valves, no burner flame scanner required	Long term reliability and low operating cost
Reactor vessel filled with porous inert matrix	Noncatalytic, nonfouling, nonhazardous
Integral shell and tube heat exchanger	Simple energy-efficient design

Industrial Applications

- ✓ Reactor Vents (Batch & Continuous)
- ✓ HVLC & LVHC Fumes at Kraft Mills
- ✓ Product Transfer & Storage Tank Vents
- ✓ Soil Vapor Extraction (Chlorinated VOCs)
- ✓ Chamber Ventilation

Options

- ✓ Allen Bradley PLC Controls
- ✓ Quench & Scrubber System
- ✓ Skid-Mounted or Field Assembled
- ✓ Material Upgrades for Corrosive Service
- ✓ Redundant Instrumentation & Interlocks
- ✓ ANSI Magnetic Drive Pumps
- ✓ Distributed Control System to Match Existing Hardware
- ✓ Waste Heat Recovery Systems (Steam, Hot Oil)

Industries Served

- ✓ Chemical/Petrochemical/Refining
- ✓ Pharmaceutical
- ✓ Manufacturing
- ✓ Remediation
- ✓ Pulp & Paper
- ✓ Medical Sterilization

Services

- ✓ Shop & Integrated System Testing
- ✓ Turnkey Engineering & Installation
- ✓ System Commissioning and Start-up
- ✓ HAZOP Reviews
- ✓ Customized Systems
- ✓ Permitting Assistance



GR™ Gas Recuperative Flameless Thermal Oxidizer

General Specifications (Selected Units)

U.S. Specification	GR - 24	GR - 40	GR - 60	GR - 120	GR - 200
FLOW RATE	600 SCFM	1,000 SCFM	1,500 SCFM	3,000 SCFM	5,000 SCFM
OXIDIZER WEIGHT	11,000 lbs	23,000 lbs	29,000 lbs	50,000 lbs	77,000 lbs
OXIDIZER DIMENSIONS (Diam. x H)	5 x 14 ft.	7 x 14 ft.	8 x 16 ft.	11 x 18 ft.	13.5 x 20 ft.
DESTRUCTION EFFICIENCY	Up to 99.99%	Up to 99.99%	Up to 99.99%	Up to 99.99%	Up to 99.99%
THERMAL DUTY (fume enthalpy plus supplemental fuel if needed)	0.382 mm BTU/hr	0.637 mm BTU/hr	0.955 mm BTU/hr	1.91 mm BTU/hr	3.18 mm BTU/hr

Metric Equivalent Specification	GR - 24	GR - 40	GR - 60	GR - 120	GR - 200
FLOW RATE	1,020 Nm ³ /hr	1,700 Nm ³ /hr	2,550 Nm ³ /hr	5,100 Nm ³ /hr	8,500 Nm ³ /hr
OXIDISER WEIGHT	5,000 Kg	10,430 Kg	13,150 Kg	22,680 Kg	34,930 Kg
OXIDISER DIMENSIONS (Diam. x H)	1.5 x 4.3 m	2.1 x 4.3 m	2.4 x 4.9 m	3.4 x 5.5 m	4.1 x 6.1 m
DESTRUCTION EFFICIENCY	Up to 99.99%	Up to 99.99%	Up to 99.99%	Up to 99.99%	Up to 99.99%
THERMAL DUTY (fume enthalpy plus supplemental fuel if needed)	112 kW	187 kW	280 kW	560 kW	982 kW

Services

Thermatrix has the engineering expertise to provide turnkey systems for your VOC abatement project. Our experienced engineering staff evaluates each application to provide the lowest life cycle cost solution. From engineering design, installation, start-up, and continued operation, Thermatrix orchestrates each project to satisfy our customer's individual abatement needs.

Whether you need to replace an existing, more expensive technology or control new emissions from expanding production, call us today and let Thermatrix effectively take you to the next level... *beyond compliance.*

101 Metro Dr., Suite 248
San Jose, CA 95110
(408) 453-0490 TEL
(408) 453-0492 FAX

308 N. Peters Rd., Suite 100
Knoxville, TN 37922
(423) 539-9603 TEL
(423) 539-9643 FAX

13 Waterside Park
Hessle, Hull, HU 13 OEG, England
(0) 1482 642 999 TEL
(0) 1482 644 050 FAX